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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Brian William HOLMES

Group Art Unit: 2872

Application No.: 10/585,189

Examiner: J. CALLAWAY

Filed: October 30, 2006

Docket No.: 128605

For: SECURITY DEVICE USING PARALLAX MOVEMENT TO VIEW FRONT AND
REAR LAYERS

DECLARATION UNDER 37 C.F.R. §1.132

I, Brian William Holmes, a British citizen of Gnomes Oak, Fleet, Hampshire, GU51 5HZ,
United Kingdom, do hereby declare as follows:

1. I am the sole inventor of the invention described and claimed in U.S. Patent

Application No. 10/585189, filed on 30 October 2006.

2. I have a doctorate and have been working in the design and construction of holograms
for over 20 years.

3. I am very familiar with the patent application, having refamiliarized with the specific
disclosed details in reviewing the Office Action dated October 2, 2009, and U.S. Patent No.
4,568,141 to Antes (hereinafter "Antes"). I comment below on the relationship between the
device disclosed in Antes and my invention.

4. Antes is recognized as the primary patent obtained by Landis & Gyr to protect their
Kinegram™ technology.

5. The device described in Antes is an embossed security device comprising a complex
arrangement, or pattern, of diffraction gratings. Typically, a visible image is generated by
arranging the gratings in an ensemble of curvilinear tracks, or line structures, such that when

the device is rotated about an axis normal to its surface plane, specific tracks and grating elements will diffract into the observer's eye in a progressive and continuous manner to create an effect of a continuously transforming image (the dynamic or kinetic color pattern) - elements of which are visible at all angles within an angular viewing hemisphere. From an origination perspective, the proprietary Kinegram™ diffraction grating recording system is analogous to a line plotter that builds up the image by writing line patterns that continuously transform into neighbouring elements, *i.e.*, the pen of line plotter is generally not raised when progressing from one curvilinear line pattern to the next.

6. Considering Figure 1 of the Antes patent, this Figure shows an elementary example of the claimed device in which the color pattern 10, *i.e.*, the dynamic diffractive image, is provided by linear tracks Bi - though as Antes says in column 4, lines 1-5, the tracks may be also circular, annular or irregular, which is best summarized as curvilinear .

~~7. Dynamic movement of color is provided within each track Bi by dividing into a series~~
of structural elements Sn, shown in Figure 1, and more explicitly in Figure 2. Each structural element Sn is distinct from neighbouring elements by virtue of its grating characteristics - that is a grating pitch or constant and a grating orientation ϕ (see column 5, lines 47-68, and column 7, lines 1-44) .

8. To understand the role of grating pitch and orientation, I first refer to Figure 3 of Antes, which shows the angular hemisphere of incidence and diffraction angle. Antes also provides three axes - the z axis which is normal to the plane of the device and the x and y axis. Imagine a light ray of a particular wavelength incident on a particular structure element of the device traveling along a z-axis. The angle by which that ray is diffracted back toward an observer relative to the z-axis will be determined by the grating pitch or constant, and reflective to the y-axis will be determined by the azimuth angle ϕ . Strictly speaking, this

angle is the angle made by the diffracted ray's projection onto an x-y plane. It should be noted light is always diffracted in a direction orthogonal to the grating pitch.

9. Finally, for an optical security device, the incident light is white or polychromatic.

When white light hits a particular structure, the effect of diffraction will be to disperse it into a spectrum of colors forming a different angle with the z-axis according to the diffraction equation $\sin \theta = d/\lambda$.

10. Antes notes, for example, at column 5, lines 47-68, that, if a structural element has a grating pitch = $0.7 \mu\text{m}$, it will diffract or disperse white light in an angular band from 35 degrees to 90 degrees relative to the z-axis, e.g., deep red colors approaching 90 degrees and deep blue approaching 35 degrees. A structural element of grating pitch = $1.2 \mu\text{m}$ will diffract light in a band from 19 to 35 degrees. If the grating pitch = $2.2 \mu\text{m}$, it will diffract the light in an angular band from 10 degrees to 19 degrees. Antes summarizes this in Figure 4 where the reference shows the hemisphere of angular diffraction pertaining to these three-grating values, i.e., the reference splits the hemisphere into three functional bands or rings covering the dispersion angles 10-19°, 19-35° and 35-90° pertaining to the three grating pitches.

11. It should be clear that these dispersion bands or rings do not represent discrete image planes distributed along the z-axis, which might be appropriately considered as representing planes of depth. Rather, the dispersion bands or rings represent viewing zones but these are strictly angular viewing zones, i.e., angles to look along to see the desired optical effect.

12. In summary, Antes teaches how to construct a dynamic two-dimensional light pattern or image by the predetermined arrangement of elementary diffraction gratings (the structure elements). Indeed the Kinegram™ security device (which is described by the Antes patent) is marketed as a two-dimensional optically variable graphics feature which both technically and

visually is complementary to conventional security holograms and their multi-layered image effects.

13. Antes, therefore, does not relate to the relationship between depth and parallax movement. Accordingly, Antes fails to teach, and would not have rendered obvious, a first holographic image element in an image plane spaced from the surface of the microstructure, the device exhibiting at least one further image in a plane spaced from said image plane of the first holographic element, as claimed in claim 1.

14. Because the dispersion bands or rings in Antes represent viewing windows or zones, Antes would have only suggested particular viewpoints to one of ordinary skill in the art, and not anything relating to the spacing between holographic elements.

15. Lastly, Antes is directed to a 2D arrangement of diffraction gratings. There is nothing in Antes to suggest the claimed layer imagery.

— I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and/or imprisonment under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing therefrom.

Date: 23RD / February / 2010
23 / 10 / 2010



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